descending coronary artery (LADCA) for the dose distribution for a left sided breast cancer patient.
Materials and Methods: One left-sided breast cancer patient treated with adjuvant radiotherapy after a breast-conserving operation in November 2012 was chosen randomly. The patient was scanned with 2.5 mm slice thickness without contrast. Oncentra® External Beam v3.3 (Nucletron, An Elekta Company) was used for delineation and planning (collapsed cone algorithm).The individual delineations (IDs) of the CTV, heart and LADCA were performed by six experienced radiographers and one experienced radiation oncologist according to our written clinical guidelines. Finally, two experienced radiographers and two radiation oncologists agreed on consensus delineation (CD) of all three volumes.The dice similarity coefficient (DSC) was used to evaluate the overlap accuracy between the CTV and the heart for each ID using the CD as a reference. Treatment plans for each of the seven IDs and the CD were optimised according to the clinical guidelines by one radiographer. The volume of the CTV receiving 95 % of the prescribed dose (50 Gy/25 fractions) or higher ($V_{95\%}$) and dose to heart and LADCA from each treatment plan were found for the CD structures.
Results: The volumes of the CD CTV and heart were 664.5 cm^3 and 550.8 cm^3, respectively. For the seven IDs the median value for the CTV and heart were 672.1 cm^3 (range 641.4 – 692.5 cm^3) and 546.7 cm^3 (539.9 – 561.5 cm^3), respectively. Median values of DSC for the CTV and heart were 0.96 (0.94 – 0.98) and 0.97 (0.95 – 0.98), respectively. All ID structures were delineated in the same slices as the CD ± one slice except for one LADCA delineation that differed by two slices. Delineations in one slice are shown in Figure 1. For the seven treatment plans, the median $V_{95\%}$ for the ID CTVs was 97.8 % (97.3 – 98.0 %). Evaluation of dose to CTV as defined on the CD from each of the seven treatment plans resulted in a median $V_{95\%}$ of 97.9 % (97.8 – 98.0). Dose constraints for the heart (V_{20Gy}<10 %, V_{40Gy}<5%) and LADCA (D_{max}<20 Gy) were not violated in any of the seven treatment plans.
Conclusions: The results of DSC for the delineated CTV and OARs for a left sided breast cancer patient show only a slight variation in delineation. No clinical relevant differences in delineation of CTV were seen between radiographers and the oncologist when using the same clinical guidelines. This is believed to be due to precisely described guidelines and education. Furthermore the small variations in delineations is believed to have no clinical influence on the treatments as seen from the very small differences in dose coverage for the CD CTV as well as the dose to the CD OARs in the treatment plans based on the IDs.

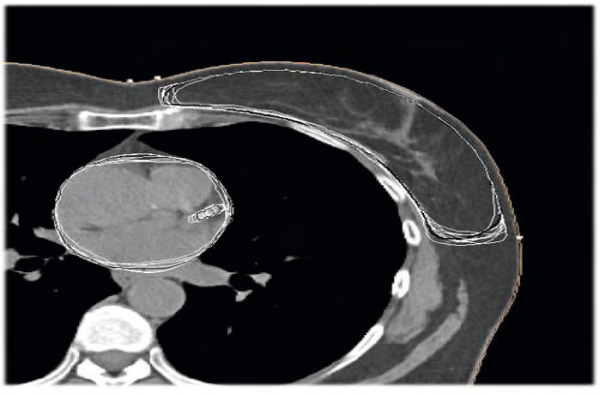

Figure 1. Delinations of CTVs, heart and LADCA: black concensus delination, white: individual delinations

EP-1045
Quality of life and cosmetic results in breast cancer patients after whole breast or partial breast irradiation
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Purpose/Objective: In early breast cancer patients conservative therapy followed by whole breast radiotherapy (WBI) offers a good quality of life (QoL). Although partial breast irradiation (PBI) is increasingly used as an alternative to WBI in selected groups of patients, its impact on QoL has not been extensively studied. This study assessed patients' QoL after PBI with high-dose rate interstitial brachytherapy (BRT) compared with WBI.
Materials and Methods: QoL was evaluated in 39 PBI patients, enrolled in a phase II prospective study (32 Gy in two daily fractions over 4 days) and in 78 matched WBI controls (50 Gy standard fractionation ± 10 Gy boost). Ten-item self-administered close-response questionnaire, exploring body image, fear of recurrence, satisfaction with treatment and cosmetic results, was administered twice during follow-up at a mean of 20 and 80 months after treatment. Italian version of questionnaire was asseverated. Physicians' and patients' cosmetic assessments were compared. Chemotherapy and hormonal therapy effect on cosmetics was analysed. The Mann-Whitney test and Wilcoxon test compared the results. The X^2 test was used for categorical data. For concordance between judgements was used Cohen's k-test of inter-rater agreement. Strength of agreement was interpreted according to the Landis and Koch's gradation. P <0.05 was considered significant.
Results: The two groups were well matched, except higher chemotherapy-treated patients in WBI group (41% vs 15%, p = 0.004). At first analysis no significant difference emerged on body image and fear of recurrence scales. PBI patients were more satisfied with treatment (p=0.019) and cosmetic outcome (p=0.0001). Second analysis included 96 patients, 33 in the PBI group, 63 in the WBI group. No significant differences were found on body image or fear of recurrence scales. Cosmetic outcome was better in PBI group (p=0.002). Results from the first and the second analysis were compared into each treatment group. Body image scale was significantly better at the first analysis in both groups (p=0.001 for PBI; p=0.0001 for WBI). Fear of recurrence scale was unchanged. No differences were found in cosmetic outcome as assessed by patients. In the first analysis physicians assessed cosmetic outcome as significantly better in PBI group (p= 0.0001) and confirmed it at second analysis. Physicians' and patients' opinions on cosmetics diverged (k = 0.148 at 2 years, 0.023 at 5 years) with physicians judging outcomes better than patients. Adjuvant chemotherapy had no impact of on cosmetics in either group according to physicians and patients.
Conclusions: Even at longer follow-up, QoL is similar after BRT PBI or WBI in terms of body image, fear of recurrence and satisfaction with treatment; PBI provides a significantly better cosmetic outcome.

EP-1046
Comparison between different forms of assessment of in-air PTV in breast irradiation with forward IMRT
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Purpose/Objective: The ICRU Report 83 suggests several methods to evaluate a PTV extending outside the contour of the body, ensuring an adequate treatment of the CTV volume. When Forward IMRT (F-IMRT) techniques are used, as is common in breast cases, tools like automatic fluence extension sometimes are not available. The purpose of this study was to analyse different approaches to correctly evaluate PTV dose in breast F-IMRT.
Materials and Methods: We analyzed data from 40 patients undergoing radiotherapy after breast conserving surgery. The patients were submitted to a CT for virtual simulation with 3 mm slices. Target volumes were outlined: breast CTV and PTV (expansions of 10 mm were made for all directions except for the posterior one, which was 7 mm). This PTV extends outside the body surface. Two sub-volumes of PTV were further established: a PTV-SV1, corresponding to the PTV 3 mm inside the body, and a PTV-SV2, corresponding to the rest of the PTV (mostly air). Treatment plans were made with a forward IMRT technique using ELEKTA XiO 4.70 treatment planning system, with a superposition calculation algorithm. To each patient 3 dosimetric plans, to be delivered with a 6 MV SIEMENS Primus linac, were calculated according to the following situations:
Plan 1. Using the delineated PTV extended outside the body surface.
Plan 2. Extending the body surface to include all PTV volume.
Plan 3. Same as Plan 2 but attributing a density to PTV-SV2 equal to the mean breast density.
For each of these situations we evaluated the mean dose to PTV and PTV-SV1 according to the ICRU 83 Report.
Results: We have obtained different results for each of the studied situations. In all approaches the Dmean to PTV-SV1 was similar to the prescription dose of 50Gy. However, only when a density was atributted to PTV-SV2 (Plan 3) the Dmean in PTV approached the prescription dose.